

1 I claim:

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3 1. A method of manufacturing a welded seamless PIPE formed at least in part of a corrosion  
4 resistant and/or erosion resistant alloy, the method comprising the steps of:

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6 manufacturing an ultrasonic inspected defect free finished plate of a corrosion and/or erosion  
7 resistant alloy;

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9 forming a hollow having a wall thickness, a length and a longitudinal seam region by feeding the  
10 finished plate through a high speed roll forming mill;

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12 welding the hollow along the longitudinal seam region using a tungsten inert gas or plasma welding  
13 process, achieving complete weld penetration through the wall thickness of the hollow with a similar  
14 filler material of like chemistry to the chemistry of the parent metal or without the use of a filler  
15 material;

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17 ultrasonically inspect with multiple probes to insure the hollow's full-length weld seam is free of  
18 defects that exceed specifications;

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20 rolling, flattening or forging the entire length of the hollow's weld seam;

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22 full body anneal the weld heat affected zone to attain a homogenous through wall structure;

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24 pickle or blast the welded hollow to remove oxide buildup from the annealing process;

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26 cold work the welded low yield and tensile strengths hollow to reduce the welded hollow in wall  
27 thickness and in outer and inner diameters, thereby producing a high yield and tensile strengths cold  
28 worked PIPE;

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30 full body ultrasonic inspection with multiple probes to insure the finished PIPE is free of defects  
31 that exceed specifications.

1       2. The method of claim 1, wherein the resulting PIPE has up to a maximum outer diameter limited  
2       only by the ability to cold work to a finished PIPE.

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4       3. The method of claim 1, wherein the finished plate which is formed of corrosion or erosion  
5       resistant alloy which is selected from the group consisting of stainless steel; conventional austenitic,  
6       high alloy austenitic, martensitic, precipitation hardened, duplex and ferritic steels; precipitation  
7       hardened and solid solution nickel-base alloys; nickel copper alloys; and cobalt-base, titanium and  
8       zirconium alloys.

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10      4. The method of claim 1, wherein the finished plate that is formed of corrosion or erosion resistant  
11     alloy formed of an alloy selected from the group consisting of nickel, chrome and titanium alloys  
12     and mixtures thereof.

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14      5. The method of claim 1, wherein the welded hollow is full body annealed at a temperature and  
15     time formulated to coincide with the wall thickness of the welded hollow.

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17      6. The method of claim 1, wherein the cold worked PIPE is greater in length than the welded  
18     hollow.

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20      7. A PIPE with corrosion or erosion inhibiting characteristics, comprising: a PIPE body having a  
21     sidewall made of a corrosion or erosion resistant alloy, the sidewall having a chromium content of  
22     at least 22% and nickel content of at least 5% by weight throughout or titanium; wherein the wall  
23     up the tubular body defines an inside diameter surface and an outer diameter, the outer diameter  
24     being up to a maximum outer diameter limited only by the ability to cold work to a finished PIPE  
25     produced by a process including the steps of:

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27     manufacturing an ultrasonic inspected defect free finished plate of a corrosion or erosion resistant  
28     alloy;

29  
30     forming a hollow having a wall thickness, a length and a longitudinal seam region by feeding the  
31     finished plate through a high speed roll forming mill;

1       welding the hollow along the longitudinal seam region using a tungsten inert gas or plasma welding  
2       process, thereby achieving complete weld penetration through the wall thickness of the hollow with  
3       similar or like filler material to that of the parent metal or without the use of a filler material;

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5       ultrasonically inspect with multiple probes to insure the hollow's full-length weld seam is free of  
6       defects that exceed specifications;

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8       rolling, flattening or forging the entire length of the hollow's weld seam;

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10      full body anneal the welded hollow to attain a homogenous granular through-wall structure of the  
11      weld and the PIPE body;

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13      pickle or blast to remove oxide buildup from the annealing process to produce a finished welded  
14      hollow;

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16      cold working the finished hollow to reduce the finished hollow in wall thickness and in outer  
17      diameter, thereby producing a cold worked PIPE.

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19      full body ultrasonic inspection with multiple probes to insure the finished PIPE is free of defects that  
20      exceed specifications.

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22      8. The method of claim 7, wherein the cold worked PIPE is greater in length than the welded  
23      hollow.